

Report as of FY2010 for 2010PA121B: "Public Education on Water Issues Related to Marcellus Gas Drilling"

Publications

- Other Publications:

- ◆ Abdalla, C, J. Drohan, B. Swistock, and S. Boser. 2011. Marcellus Shale Gas Well Drilling: Regulations to Protect Water Supplies in Pennsylvania. Penn State Extension fact sheet, 6 pp.
http://extension.psu.edu/water/marcellus-shale/marcellus-shale-gas-well-drilling-regulationsto-protect-water-supplies-in-pennsylvania/at_download/file
- ◆ Abdalla, C., J. Drohan, K. Saacke Blunk, and J. Edson. Marcellus Shale Wastewater Issues in Pennsylvania—Current and Emerging Treatment and Disposal Technologies. 2011. Penn State Extension fact sheet, 9 pp.
http://extension.psu.edu/water/marcellus-shale/marcellusshale-wastewater-issues-in-pennsylvania-current-and-emerging-treatment-and-disposaltechnologies/at_download/file
- ◆ Sjolander, S., J. Clark, D. Rizzo and J. Turack. Introduction to Hydrofracturing. 2011. Penn State Extension fact sheet, 7 pp.
http://extension.psu.edu/water/marcellus-shale/introductionto-hydrofracturing/at_download/file
- ◆ Swistock, B. Testing Drinking Water Supplies Near Gas Drilling Activity. 2011. Penn State Extension fact sheet, 4 pp.
http://extension.psu.edu/water/marcellus-shale/testing-drinkingwater-supplies-near-gas-drilling-activity/at_download/file
- ◆ Abdalla, C. J. Drohan, and J. Becker. 2010. River Basin Approaches to Water Management in the Mid-Atlantic States, Penn State Extension publication UA466, 28 pp.
<http://pubs.cas.psu.edu/FreePubs/pdfs/ua466.pdf>
- ◆ Swistock, B. 2010. Chain of Custody Water Testing, Penn State Extension fact sheet, 3 pp.
http://extension.psu.edu/water/marcellus-shale/thirdpartylibs.pdf/at_download/file
- ◆ Abdalla, C. and J. Drohan. 2010. Water Withdrawals for Development of Marcellus Shale Gas in Pennsylvania, Penn State Extension publication UA460, 12 pp.
http://extension.psu.edu/water/resources/publications/consumption-andusage/marcelluswater.pdf/at_download/file

Report Follows

PROJECT TITLE AND PRINCIPAL INVESTIGATORS

Public Education on Water Issues Related to Marcellus Gas Drilling

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PROBLEMS AND RESEARCH OBJECTIVES

New drilling technologies to reach previously untapped gas reserves in the Marcellus shale have resulted in expanded drilling of deep gas wells throughout much of Pennsylvania. Marcellus gas drilling is a more intensive process in comparison to traditional gas drilling that has been commonplace throughout western and northern Pennsylvania for many decades. The scale of Marcellus activity, both geographically and spatially, has created concerns related to the amount of water used, safety of hydrofracturing, disposal of waste fluids, and protection of streams, wetlands and drinking water supplies during the drilling process. The objective of this project was to organize a team of Penn State Extension field educators and specialists to deliver unbiased public education on water issues related to Marcellus gas drilling activities.

METHODOLOGY

The project first built a team of water resources specialists and extension educators through a face-to-face training workshop in early 2010. The team then organized to create a series of written and web-based educational resources on various water issues related to Marcellus gas drilling. These resources were housed on a new web site and were also used to deliver numerous face-to-face and online workshops for various stakeholder groups throughout the Marcellus region. Evaluations were used to document impacts from these educational efforts.

PRINCIPAL FINDINGS AND SIGNIFICANCE

Penn State Extension is recognized as a source of unbiased, factual information related to Marcellus gas drilling. This project resulted in the development of a cohesive, statewide team of nine Extension water specialists and county educators who can respond to current and future needs for public education on water resources issues Marcellus gas drilling. A web site was created to house the resources created by the group at: <http://extension.psu.edu/water/marcellus-shale>. The website currently receives about 1,500 visitors each month and is growing rapidly. This combination of a dedicated team of trained educators and extensive educational resources creates a strong, statewide effort to provide unbiased education on water issues related to Marcellus gas development. The attendance at workshops and evaluation data from participants demonstrate the strong public interest in this subject and the critical need for unbiased, factual information on the topic.

STUDENTS & POSTDOCS SUPPORTED

- Michelle Cleveland, M.S. Ecology, 2010 – Michelle was employed on wages during the fall of 2010 to assist with publications and web site development.
- Shawn Rummel, Post Doc, PhD, Ecology, 2010 – Shawn was also briefly employed during the spring and summer of 2010 to assist with publications and video script preparation.

EXTENSION PUBLICATIONS

Team members created a series of seven extension publications on critical water issues related to Marcellus gas drilling including:

1. Abdalla, C, J. Drohan, B. Swistock, and S. Boser. 2011. Marcellus Shale Gas Well Drilling: Regulations to Protect Water Supplies in Pennsylvania. Penn State Extension fact sheet, 6 pp. http://extension.psu.edu/water/marcellus-shale/marcellus-shale-gas-well-drilling-regulations-to-protect-water-supplies-in-pennsylvania/at_download/file
2. Abdalla, C., J. Drohan, K. Saacke Blunk, and J. Edson. Marcellus Shale Wastewater Issues in Pennsylvania—Current and Emerging Treatment and Disposal Technologies. 2011. Penn State Extension fact sheet, 9 pp. http://extension.psu.edu/water/marcellus-shale/marcellus-shale-wastewater-issues-in-pennsylvania-current-and-emerging-treatment-and-disposal-technologies/at_download/file
3. Sjolander, S., J. Clark, D. Rizzo and J. Turack. Introduction to Hydrofracturing. 2011. Penn State Extension fact sheet, 7 pp. http://extension.psu.edu/water/marcellus-shale/introduction-to-hydrofracturing/at_download/file
4. Swistock, B. Testing Drinking Water Supplies Near Gas Drilling Activity. 2011. Penn State Extension fact sheet, 4 pp. http://extension.psu.edu/water/marcellus-shale/testing-drinking-water-supplies-near-gas-drilling-activity/at_download/file
5. Abdalla, C. J. Drohan, and J. Becker. 2010. River Basin Approaches to Water Management in the Mid-Atlantic States, Penn State Extension publication UA466, 28 pp. <http://pubs.cas.psu.edu/FreePubs/pdfs/ua466.pdf>
6. Swistock, B. 2010. Chain of Custody Water Testing, Penn State Extension fact sheet, 3 pp. http://extension.psu.edu/water/marcellus-shale/thirdpartylabs.pdf/at_download/file
7. Abdalla, C. and J. Drohan. 2010. Water Withdrawals for Development of Marcellus Shale Gas in Pennsylvania, Penn State Extension publication UA460, 12 pp. http://extension.psu.edu/water/resources/publications/consumption-and-usage/marcelluswater.pdf/at_download/file

PRESENTATIONS AND OTHER INFORMATION TRANSFER ACTIVITIES

The project team utilized the various resources developed in this project to present 46 educational programs or webinars in 21 counties throughout the Marcellus region of the state. These programs were attended by over 3,500 participants including water supply owners, legislators, local government officials, farmers, researchers, and water resources professionals. Topics of workshops included general water issues related to Marcellus gas drilling, protecting private drinking water supplies, interpreting water test reports, and strategies to treat or dispose of drilling wastewaters. Dates, location, topics and attendees (in parentheses) for each workshop are listed below:

1. 3/1/2010, State College, PA, Water Resources Issues Related to Natural Gas Drilling (95)
2. 3/5/2010, Dimock, PA, Gas Well Drilling and Private Water Supplies (63)
3. 3/10/2010, Harrisburg, PA, Water Resources Issues Related to Natural Gas Drilling (22)

4. 3/20/2010, State College, PA, Water Resources Issues Related to Natural Gas Drilling (80)
5. 3/23/2010, State College, PA, Water Resources Issues Related to Natural Gas Drilling (68)
6. 4/20/2010, Hershey, PA, Water Resources Issues Related to Natural Gas Drilling (102)
7. 5/4/2010, State College, PA, Water Resources Issues Related to Natural Gas Drilling (12)
8. 5/12/2010, Wyalusing, PA, Gas Well Drilling and Private Water Supplies (115)
9. 5/13/2010, Lake Lehman, PA, Gas Well Drilling and Private Water Supplies (137)
10. 5/17/2010, Renovo, PA, Water Resources Issues Related to Natural Gas Drilling (6)
11. 5/20/2010, New Castle, PA, Water Resources Issues Related to Natural Gas Drilling (135)
12. 6/1/2010, Pittsburgh, PA, Water Resources Issues Related to Natural Gas Drilling, (100)
13. 6/9/2010, State College, PA, Water Resources Issues Related to Natural Gas Drilling (22)
14. 6/10/2010, Waynesburg, PA, Water Resources Issues Related to Natural Gas Drilling (33)
15. 6/14/2010, State College, PA, Wastewater Reuse and Recycling for Marcellus Gas Drilling (51)
16. 6/15/2010, Honesdale, Gas Well Drilling and Private Water Supplies, (90)
17. 6/21/2010, Clarion, PA, Water Resources Issues Related to Natural Gas Drilling (210)
18. 6/22/2010, Ford City, PA, Water Resources Issues Related to Natural Gas Drilling (140)
19. 7/20/2010, Lancaster, PA, Water Testing Near Marcellus Gas Drilling (36)
20. 7/26/2010, Wysox, PA, Water Resources Issues Related to Natural Gas Drilling (47)
21. 8/5/2010, Wysox, PA, Interpreting Pre and Post Gas Drilling Water Test Reports (220)
22. 8/11/2010, Dimock, PA, Interpreting Pre and Post Gas Drilling Water Test Reports (139)
23. 8/17/2010, Rock Springs, PA, Gas Well Drilling and Private Water Supplies (42)
24. 8/18/2010, Rock Springs, PA, Gas Well Drilling and Private Water Supplies (47)
25. 8/19/2010, Clarion, PA, Water Resources Issues Related to Natural Gas Drilling (110)
26. 8/19/2010, Rock Springs, PA, Gas Well Drilling and Private Water Supplies (29)
27. 8/23/2010, Wysox, PA, Interpreting Pre and Post Gas Drilling Water Test Reports (60)
28. 9/14/2010, Wellsboro, PA, Interpreting Pre and Post Gas Drilling Water Test Reports (76)
29. 9/15/2010, Statewide webinar, Interpreting Pre and Post Gas Drilling Water Test Reports (57)
30. 9/24/2010, University Park, PA, Water Resources Issues Related to Natural Gas Drilling (52)
31. 9/27/2010, Lehman, PA, Interpreting Pre and Post Gas Drilling Water Test Reports (43)
32. 9/29/2010, Baltimore, MD, Water Resources Issues Related to Natural Gas Drilling (104)
33. 10/13/2010, State College, PA, Gas Well Drilling and Private Water Supplies (75)
34. 10/19/2010, Tunkhannock, PA, Interpreting Pre and Post Gas Drilling Water Test Reports (76)
35. 10/27/2010, Statewide webinar, Water Resources Issues Related to Natural Gas Drilling (32)
36. 12/1/2010, Ebensburg, PA, Water Resources Issues Related to Natural Gas Drilling (53)
37. 12/14/2010, State College, PA, Water Resources Issues Related to Natural Gas Drilling (18)
38. 12/14/2010, Scranton, PA, Gas Well Drilling and Private Water Supplies, (40)
39. 12/15/2010, Johnstown, PA, Water Resources Issues Related to Natural Gas Drilling (53)

40. 12/16/2010, Venango County, PA, Water Resources Issues Related to Natural Gas Drilling (150)
41. 12/16/2010, Clarion, PA, Water Resources Issues Related to Natural Gas Drilling (80)
42. 1/28/2011, Grantville, PA, Gas Well Drilling and Private Water Supplies (210)
43. 2/3/2011, Coudersport, PA, Interpreting Pre and Post Gas Drilling Water Test Reports (48)
44. 2/9/2011, Trout Run, PA, Gas Well Drilling and Private Water Supplies (20)
45. 2/16/2011, Baltimore, MD, Water Resources Issues Related to Natural Gas Drilling (131)
46. 2/21/2011, Canton, PA, Gas Well Drilling and Private Water Supplies (22)

Approximately 1,200 of the 3,550 attendees at these workshops completed and returned a workshop evaluation. Results of these evaluations showed that:

- 92% planned to use the information to better manage and protect their water resources near gas drilling activity and
- 85% felt that the information presented was unbiased and factual

A follow-up evaluation of attendees found that 87% had taken a recommended action to protect water resources near gas drilling. Some of the most common actions reported were:

- Using DEP tools to learn about gas well locations (26%)
- Stipulate water protection strategies in a subsequent gas lease (8%)
- Have drinking water tested by a state accredited water lab before drilling (20%)
- Purchase a TDS meter to monitor water during drilling (5%)
- Have water quantity documented by a water well contractor or hydrogeologist (5%)

A short (8-minute) web-based video was produced by a professional videographer (Christopher Fagan, State College, PA) for use in online programs and by team members. The video discusses basic water issues related to Marcellus gas drilling. A draft of the video currently resides on YouTube at <http://www.youtube.com/watch?v=jWmiLUPKHIE>. The video will also be linked to the Penn State Water Resources Extension website and hardcopies will be distributed to team members for use in educational programs.

AWARDS

The investigators on the project received the Penn State Extension, Team Award at the Extension Annual Conference in Altoona, PA in November, 2010 for their work on the Extension Safe Drinking Water Team. Much of this award was related to programs developed as a result of this project for private water system owners in the Marcellus region of the state.

ADDITIONAL FUNDING ACQUIRED USING USGS GRANT AS SEED MONEY

None

PHOTOS OF PROJECT



Water Resources Extension educator Peter Wulfhorst (background) and specialist Bryan Swistock (foreground) assist several homeowners with interpretation of pre gas drilling water test reports.



Water Resources Extension Specialist Bryan Swistock discusses regulations to protect drinking water supplies from gas drilling activity with approximately 100 homeowners in Tunkhannock, PA.